Soliton Waves and Their Effect on Other Electromagnetism Mid-Flight as it Relates to Relative Direction of Travel; Using Solitons to Alter the Trajectory of Other EM for "Quiet Jamming" of Enemy Radars

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Introduction

As I have already circumscribed at some length, soliton waves may be used to focus other forms of electromagnetism, for instance, an X-Ray laser. By nesting the EM to be focused in the center of a constant series of flat soliton waves, energy can be delivered to a target as effectively as if it were emitted from only a few feet away despite it originating from orbital distances.

Abstract

What, then, is the dynamic between soliton waves and EM moving in the opposite direction or even in the transverse direction (perpendicularly?) The effect, I propose, strongly varies depending upon the relative direction of travel, and thus, these waves can be creatively used to alter the path of EM in other ways.

In the case where EM is moving in the opposite direction, the soliton wave would have a scattering effect, not nullifying EM but acting more like a scattering lens that would, in effect, diminish a radar return. This may be useful in the event soliton emitters are ever miniaturized to the point where they could be employed in a fighter jet, however, current doctrine does not call for fighters to utilize active radar emission unless absolutely necessary.

Much more useful, however, would be striking EM with a series of soliton waves on a perpendicular course. In this case, I can predict that the EM would be pushed by the wave to the side in such a way that its angular momentum/heading would be incrementally shifted with each wave it interacts with. Megahertz-frequency EM, which would ordinarily proceed in a straight line extending into outer space, could be made to follow the curvature of the Earth and arrive at a point over the horizon. This would be quite different from the way shortwave radios reach the other side of the globe by way of repeated bounces off of the ionosphere. Achieving this would require a network of costly geosynchronous soliton platforms to generate that sort of beam curvature and would not be practical. Any soliton wave source powerful enough to cause a particular megahertz frequency microwave beam to follow a curved path would inadvertently cause all EM in an area to do this, which would generate harmful interference with other communication networks. Thus, it would not be a practical means of forcing microwaves to follow the curve of the Earth to facilitate communication.

Where such soliton waves can shine, however, is when applied to subtly corrupting radar returns of an adversarial force in a localized area.

Just as solitons can be used to gradually throw off the accuracy of the atomic

clocks in GPS satellites, according to slightly different principles, those same waves can be used to cause radar operators to receive actual radar returns but with incorrect positional data. If the influence is introduced gradually, they would most likely not notice the change in position in a combat situation.

The easiest illusion that could be created, given the direction of travel of the waves in the case of space-based platforms, is the illusion that aircraft are flying at a higher altitude than they actually are. This is because pushing EM originally intended to be directed in a more upward angle downward will trick radar systems into thinking that everything in the area is somewhat higher than it really is. When used in a targeted way, this method could be used to trick an air traffic controller into instructing a pilot to deliberately fly at the same altitude as another plane on a cross trajectory, leading to a collision.

In a combat scenario, a soliton emitter broadcasting from a 90-degree angle could be used to create the illusion that an approaching formation of aircraft are hundreds of miles east, west, north, or south of their true position. This effect could be convincingly achieved by utilizing a combination of two or more space-based platforms. For this to succeed, the solitons would have to be aimed dynamically, taking into account the changing position of friendly aircraft.

A simpler and safer spoofing approach would involve generation of a more poweful nudge at a straight-down angle to cause all radar returns to terminate in the ocean, for instance, hundreds of miles short of the receiver they were intended for. This approach could be used to shroud even non-stealth components of an air force without tipping off radar operators that something is wrong, as jamming would. The radar operator, in that case, would continue receiving signals from all areas except for the blanketed area and would most likely not notice a problem before it was too late.

Just as missile defense is predicated upon intercepting a missile with another missile, solitons can be used to intercept and redirect electromagnetism with... you guessed it, more electromagnetism.

Interestingly, an adversarial force employing soliton-based ground radars to detect stealth platforms would lose the benefit of such a system if a space-based soliton emitter were constantly employed in a contested area. The dynamics between two transverse soliton waves is slightly different than the dynamic between a soliton wave and standard EM. In the case of the soliton waves emitted from the ground, assuming the enemy even had this level of sophistication, the transverse wave intersection would result in the soliton emitted from the ground (likely the weaker of the two soliton waves) losing coherence and converting back into standard EM. It would then quickly fall under the effects of the more powerful space-based system and would be nudged off-course.

Conclusion

Once a situation exists in which two parties were fully aware of this technology, it would be a cliched case of the party with the more powerful emitter "winning." In that scenario, it would be unlikely that the presence of

such emitters could be kept secret.

In either case, such systems would bestow an advantage, but for maximal advantage, one side would have to employ these systems without the knowledge of the other.